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This dissertation represents at least four years of dedicated research into artificial intelligence, a topic that has always fascinated me. During my previous research in the field of computer vision I already had a chance to do research into evolutionary algorithms for solving several real-life challenges (among which was bacterial colony counting). Deep learning has caused, which can genuinely be called, a revolution in the field of computer vision. During this research I started out with traditional techniques and gradually found new ways to integrate existing computer vision knowledge and deep learning. Ironically, I ended up finding an improved method for counting. The main challenge throughout this project was keeping up with the high pace of the developments within the field.

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